

THE MANAGER

FORAGE MANAGEMENT

Add organic matter and keep organic matter in the soil for sound soil management and better crop yields

Managing Soils for Better Crops

By Karl Czymmek and Quirine Ketterings

Soil health. Soil quality. Cover crops. Rotation. Conservation tillage. Aggregate stability. No tillage. Soil organic matter. Soil nitrogen supply potential. Root exudates. Glomalin. Lots of words and phrases but what's it really all about? The bottom line: If you take care of your soil, it will take care of you. Though sometimes very difficult to evaluate in simple economic terms, sound soil management practices are key to better crop yields. Implementing sound soil management is a very important strategy to manage year to year and field to field variability in home-grown forage, and hence feed management of dairies. So what are the main concepts? There are two main ones: (1) add any kind of organic matter any chance you get; and (2) maintain as much organic matter as possible. Let's dive into this.

1) Add any kind of organic matter any chance you get. Why? Soil organic matter is a fantastic insurance policy. It supplies and retains nutrients, and can release them to support higher yields when growing conditions for crops are favorable. Soil organic matter can hold moisture when drought strikes, and improve drainage soil is too wet. This allows for more consistent year to year crop inventories than can be obtained with fields low in organic matter. Organic matter supports a wide range of soil organisms that contribute to nutrient cycling, support strong root development and other soil conditions that enhance plant growth and productivity. How can we increase organic matter levels? Dairy rotations commonly contain

corn silage, leaving little residue, but manure applications to corn and the ground coverage under hay years make up for this, right? Not necessarily so. Data from around the northeast show that current dairy rotations with modest, frequent liquid manure applications can maintain soil organic matter levels. This is better

than the negative trend observed without manure additions, but points to the need to do more than just implement a corn-hay rotation and fertilize corn with liquid manure. What else can we do? A rotation of 3 or 4 years of corn silage followed by hay will likely need cover crops and/or reduced tillage to maintain or increase soil organic matter levels over time. Studies indicate that the most active nutrient cycling soils need a varied diet of organic matter sources. Quantities of organic matter, fresh, residual, pre-digested or composted, including green manure, animal manure without bedding, animal manure with bedding, legumes and grasses, are all important sources. Cover crops must be winter hardy to maximize carbon and nutrient contribution, especially in the north where growing season is minimal after corn silage harvest, and carbon accumulations in the fall may be limited to less than 1 ton/acre.

2) Keep as much organic matter in the soil as you can. Tillage mixes air into the soil, fueling microbes that break down organic matter. Some reasons for tilling on a dairy include: incorporation of manure, working up ruts from wet harvest and weed control. Many producers now implement reduced tillage methods. More could consider options such as zone tillage, aerator incorporation of manure, and other reduced tillage options.

Keep these concepts to improve soils and have better crop results over time. Even excellent soils can be improved by adding organic matter. Take time this winter to research cover crop options for your area so that when corn silage comes off next fall, you are ready to give something back to your soil. This investment that will return many times over. □



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■ Karl Czymmek is the PRO-DAIRY specialist in the areas of nutrient and environmental management. Contact him at 607.255.4890. Email: kjc12@cornell.edu

■ Quirine Ketterings is an Associate Professor in Nutrient Management in Agricultural Systems and Nutrient Management Spear Program in the Department of Animal Science. Contact her at 607/255-3061. Email: qmk2@cornell.edu